

REMARKS

Claims 9 and 16 are amended herein. Support for the amendments can be found throughout the specification, including pages 16-18 and 22, as well as Figures 9 and 10. Claims 1-8, 12 and 19 have been previously cancelled. Accordingly, Claims 9-11, 13-18 and 20-22 remain pending. In view of the amendments and remarks set forth herein, reconsideration is respectfully requested.

Rejections Under 35 U.S.C. §112, First Paragraph

Claims 9-11, 13-18, and 20-22 stand rejected under 35 U.S.C. §112, first paragraph, as failing to comply with the written description requirement. More specifically, the examiner asserts that the claims contain subject matter which was not described in the specification in such a way to reasonably convey to one skilled in the relative art that the inventors, at the time the application was filed, had possession of the claimed invention.

The examiner asserts that the limitation added to independent Claims 9 and 16 in the last Amendment, that the filling of the hole with molten metal be “by relatively reducing pressure in the non-through hole compared with pressure outside the non-through hole” includes subject matter beyond that which is disclosed in the specification. The examiner asserts that the specification at pages 16-18 and 22 specifically discloses a process where the plating solution is provided in a decompression chamber, the pressure into the chamber is reduced, and the substrate is immersed into the plating solution; and then after immersion, the chamber is pressurized so that the plating solution flows into the inside of the holes.

As stated, above, Claims 9 and 16 have been amended in order to include the language recommended by the examiner. Support for the amendments can be found throughout the specification, including pages 6-18, 22, and Figures 9-10.

Rejections Under 35 U.S.C. §103(a)

Claims 9-11 and 13-15 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Japan 04-206875 (hereinafter '875 patent) in view of Amano (US 5,289,038), Schneble, Jr. (US 3,628,999) and Sugitani (US 5,657,815). The '875 patent, Amano, and Schneble are all cited and relied as set forth in the previous Office Action. However, Sugitani is relied upon for the disclosure of a new pressurization element added in the last Amendment. This pressurization element has been deleted from Claims 9 and 16.

The examiner asserts that Sugitani teaches a method of impregnating shaped porous material of particles with molten metal by providing the shaped porous material in a passage mould, passing the material into a molten filled cavity so that the shaped material is immersed into the molten metal, and providing pressure to the molten metal so that it is injected under pressure to cause the molten metal to penetrate the aggregation of the particles through the interstices between the particles, and then passing the impregnated material out of the cavity to cool and solidify. Citing Figures 7-8; column 7, line 55 through column 8, line 33; column 9, line 65 through column 10, line 6; and column 14, line 25 through column 15, line 50.

However, Sugitani merely discloses the use of a static pressure head of the molten metal in the molten metal storage vessel and, if necessary, pneumatic pressure control in the molten metal storage vessel. Sugitani does not disclose providing the molten metal in a decompression chamber, reducing the pressure inside the chamber, and immersing the substrate in the molten metal, and then after immersion, pressuring the chambers so that the molten metal flows into the inside of the holes.

Furthermore, Sugitani relates to a method for producing *a composite product of an inorganic material and metal* in which a composite mixture of the molten metal 72 and the *fluid-state* inorganic material 68 is formed. See, for example, column 1, lines 7-10; column 14, lines

41-47; column 15, lines 31-32; and Figure 7. Therefore, Sugitani is non-analogous art and is related to a field that is quite different from that of the present invention, which relates to a method filling a non-through hole/through-hole of a *solid-state* substrate with molten metal. Therefore, it would not be obvious for a person skilled in the art to combine the device in the '875 patent in view Amano and Schneble with Sugitani.

Since all of the claimed elements are not suggested or disclosed by the cited references, withdrawal of the obviousness rejection is respectfully requested.

Claims 16-18 and 20-22 stand rejected under 35 U.S.C. §103(a) as being unpatentable over the '875 patent in view of Amano, Schneble and Sugitani as applied above and further in view of Locke (US 5,245,751).

The examiner asserts that the '875 patent in view of Amano, Schneble and Sugitani teach all of the features of the claims except (1) that the hole is a through hole that extends through the work piece and that the metal filling method further comprises closing the opening of the through holes and then opening the closed opening, and (2) the closing of the opening using sealing material. The examiner then relies upon Locke for the disclosure of these elements.

As stated above, Claim 16 has been amended to specify that the through hole is filled with molten metal by providing the molten metal in a decompression chamber, reducing the pressure into the chamber, immersing the substrate into the molten metal, and then after immersion, pressurizing the chamber so that the molten metal flows into the inside of the through hole. As stated above, this element is not disclosed or suggested by any of the cited references.

Accordingly, withdrawal of the rejections of Claims 16-18 and 20-22 under 35 U.S.C. §103(a) is respectfully requested.

Claims 9-11 and 13-15 stand rejected under 35 U.S.C. §103(a) as being unpatentable over the '875 patent in view of Amano, Schneble and Japan 2002-158191 (hereinafter '191 patent). The examiner asserts that the '191 patent teaches that a known way of filling metal in fine pores of substrates is to provide a molten metal tank in a vacuum chamber, reduce the pressure in the chamber, immerse the substrate in the molten metal tank, and then pressurizing the chamber to fill the molten metal into the pores without generating an air gap in the pores.

In Section 12 on page 18 of the Office Action, the examiner asserts that Applicant cannot rely upon the foreign priority papers to overcome the rejections that rely upon Japan 2002-158191 because a translation of the foreign priority papers have not been made of record in accordance with 37 C.F.R. 1.55. A Claim of Priority in accordance with 37 C.F.R. 1.55 together with a translation of the foreign priority applications is being submitted herewith.

Accordingly, withdrawal of the rejections of Claims 9-11 and 13-15 under 35 U.S.C. §103(a) is respectfully requested.

Claims 16-18 and 20-22 stand rejected under 35 U.S.C. §103(a) as being unpatentable over the '875 patent in view of Amano, Schneble, and the '191 patent as applied to Claims 9-11 and 13-15 above, and in further view of Locke et al. As discussed above, Claim 16 has been amended to specify that filling the through hole with molten metal is by providing the molten metal in a decompression chamber, reducing the pressure into the chamber, immersing the substrate in the molten metal, and then after immersion, pressuring the chamber so that the molten metal flows into the inside of the through hole. The '191 patent has been removed as prior art by the submission of the Claim of Priority document. Therefore, the remaining cited references do not disclose or suggest all of the elements set forth in Claims 16 or the claims dependent thereon.

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Accordingly, withdrawal of the rejection of Claims 16-18 and 20-22 under 35 U.S.C. §103(a) is respectfully requested.

Conclusion

Applicants submit that the application is now in proper form for allowance, which action is earnestly solicited. If resolution of any remaining issue is required prior to allowance of the application, it is respectfully requested that the Examiner contact Applicants' attorney at the telephone number provided below.

Respectfully submitted,

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